REMARKS

Applicants appreciate the indication of allowability for original Claims 9 and 21. By the above amendment, Applicant has inserted the limitation of these dependent claims into the appropriate independent claims. As these claims are free of rejection, and have been examined broadly as indicated at the top of page 3 of the Official Action, Applicants respectfully submit that the claims are now in condition for allowance, and an early Notice of Allowance is respectfully requested.

Respectfully submitted,

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IN THE CLAIMS

Please amend Claims 1, 10, 11, 12, 13, 22, 23 and 24 as follows:

1. (Amended) A semiconductor structure comprising:

a monocrystalline silicon substrate;

an amorphous oxide material overlying the monocrystalline silicon substrate;

a monocrystalline perovskite oxide material overlying the amorphous oxide material;

a monocrystalline compound semiconductor material overlying the monocrystalline perovskite oxide material; and

an arrayed wavelength grating device overlying the monocrystalline silicon substrate, wherein the arrayed wavelength grating device comprises

a plurality of electro-optical waveguides formed within the monocrystalline compound semiconductor layer, each waveguide of the plurality of electro-optical waveguides carrying an optical signal of a distinct wavelength, and

a first electrode formed in the monocrystalline compound semiconductor layer and above the plurality of electro-optical waveguides, the first electrode operable to provide a distinct phase shift to each waveguide of the plurality of electro-optical waveguides in response to an application of voltage to the first electrode.

9. (Cancelled).

10. (Amended) The semiconductor structure of claim [9] 1, wherein:

the arrayed wavelength grating device further [includes] comprises

a planar waveguide region in optical communication with the plurality of electro-optical waveguides, and

a second electrode formed in the monocrystalline compound semiconductor layer and above the planar waveguide region, the second electrode operable to tune a temperature sensitivity of the plurality of electro-optical waveguides.

11. (Amended) The semiconductor structure of claim [9] 1, wherein:

the arrayed wavelength grating device further [includes] comprises

a planar waveguide region in optical communication with the plurality of electro-optical waveguides, and

a second electrode formed in the monocyrstalline compound semiconductor layer and above the planar waveguide region, the second electrode operable to tune a polarization-dependent wavelength of the plurality of electro-optical waveguides.

12. (Amended) The semiconductor structure of claim [9] 1, wherein:

the arrayed wavelength grating device further [includes] comprises

a planar waveguide region in optical communication with the plurality of electro-optical waveguides, and

a second electrode formed in the monocyrstalline compound semiconductor layer and above the planar waveguide region, the second electrode operable to tune a channel wavelength offset of the plurality of electro-optical waveguides.

13. (Amended) A process for fabricating a semiconductor structure comprising:

providing a monocrystalline silicon substrate;

depositing a monocrystalline perovskite oxide film overlying the monocrystalline silicon substrate, the film having a thickness less than a thickness of the material that would result in strain-induced defects;

forming an amorphous oxide interface layer containing at least silicon and oxygen at an interface between the monocrystalline perovskite oxide film and the monocrystalline silicon substrate;

epitaxially forming a monocrystalline compound semiconductor layer overlying the monocrystalline perovskite oxide film; and

forming an arrayed wavelength grating device overlying the monocrystalline silicon substrate,

wherein the arrayed wavelength grating device comprises

a plurality of electro-optical waveguides formed within the monocrystalline compound semiconductor layer, each waveguide of the plurality of electro-optical waveguides carrying an optical signal of a distinct wavelength, and

a first electrode formed in the monocyrstalline compound semiconductor layer and above the plurality of electro-optical waveguides, the first electrode operable to provide a distinct phase shift to each waveguide of the plurality of electro-optical waveguides in response to an application of voltage to the first electrode.

21. (Cancelled).

22. (Amended) The process of claim [21] 13, wherein:

the arrayed wavelength grating device further [includes] comprises

a planar waveguide region in optical communication with the plurality of electro-optical waveguides, and

a second electrode formed in the monocyrstalline compound semiconductor layer and above the planar waveguide region, the second electrode operable to tune a temperature sensitivity of the plurality of electro-optical waveguides.

23. (Amended) The process of claim [21] 13, wherein:

the arrayed wavelength grating device further [includes] comprises

a planar waveguide region in optical communication with the plurality of electro-optical waveguides, and

a second electrode formed in the monocyrstalline compound semiconductor layer and above the planar waveguide region, the second electrode operable to tune a polarization-dependent wavelength of the plurality of electro-optical waveguides.

24. (Amended) The process of claim [21] 13, wherein:

the arrayed wavelength grating device further [includes] comprises

a planar waveguide region in optical communication with the plurality of electro-optical waveguides, and

a second electrode formed in the monocyrstalline compound semiconductor layer and above the planar waveguide region, the second electrode operable to tune a channel wavelength offset of the plurality of electro-optical waveguides.--